DIRECT TESTIMONY AND EXHIBITS OF

DAN J. WITTLIFF, P.E., BCEE

ON BEHALF OF

THE SOUTH CAROLINA OFFICE OF REGULATORY STAFF

DOCKET NO. 2018-318-E

IN RE: APPLICATION OF DUKE ENERGY PROGRESS, LLC

FOR ADJUSTMENT IN ELECTRIC RATE SCHEDULES AND TARIFFS

AND REQUEST FOR AN ACCOUNTING ORDER

TABLE OF CONTENTS

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Dan Wittliff. My business address is 919 Congress Avenue, Suite 1110, Austin, Texas 78701.

Q. PLEASE OUTLINE YOUR FORMAL EDUCATION.

A. I am a 1972 graduate of Southern Methodist University where I earned a Bachelor of Science degree in mechanical engineering and membership in Pi Tau Sigma mechanical engineering honorary. In 1975, I earned a Master of Business Administration from the University of Oklahoma where I was elected to membership in the Beta Gamma Sigma business honorary society.

Q. WHAT IS YOUR PRESENT POSITION?

A. I am Managing Director of Environmental Services for GDS Associates, Inc. ("GDS") in Austin, Texas.

Q. WOULD YOU PLEASE DESCRIBE GDS?

A. GDS is an engineering and consulting firm headquartered in Marietta, Georgia with offices in Austin, Texas; Auburn, Alabama; Manchester, New Hampshire; Madison, Wisconsin; and Orlando, Florida. GDS provides technical and financial consulting services to a nationwide base of clients including utilities, Public Service Commissions, large consumers of energy, and various agencies. Areas of expertise include power generation support and management consulting, power supply and transmission planning, rate consulting, distribution services, least cost planning, environmental including permitting and compliance, and litigation support. Power generation support services provided by the firm include plant operational monitoring on behalf of co-owners of fossil and nuclear power plants, plant ownership feasibility studies, plant management audits, plant construction cost and schedule analyses, evaluations of power plant O&M costs and budgeting practices, production cost modeling and plant outage and replacement power cost evaluations, and environmental compliance.

Q. PLEASE STATE YOUR PROFESSIONAL EXPERIENCE.

A. I have been employed by GDS since January 2007. I manage complex and multi-media (e.g., air, water, wastewater, and solid waste) environmental projects including natural gas and coal power plant development, operations, and compliance. Experience previous to joining GDS includes serving as the first Chief Engineer for the Texas Natural Resource Conservation Commission, now known as the Texas Commission on Environmental Quality, which is second only to the Environmental Protection Agency in terms of size. During my four and half years as Chief Engineer, I advised the commissioners of the agency on all aspects of environmental permitting and compliance. This scope spanned the full range of utility plant operations including coal plant operations. In addition, I oversaw the functions of innovative technology, toxicology, and pollution control property tax abatements. Further, as Chief Engineer, I resolved technical disagreements between permittees and the agency and within the agency. Before my service with the Texas Natural Resource Conservation Commission, I served in numerous supervisory positions with West Texas Utilities Company, headquartered in Abilene, Texas, managing the company's multi-media environmental compliance program and overseeing power station performance including issues related to air pollution, water treatment, industrial hygiene, and solid waste disposal. Coal-fired plant operations and compliance were a major part of my responsibilities. Immediately prior to joining GDS Associates, I was Principal of Dan Wittliff Consulting, PLLC. This firm provided professional environmental engineering services that focused on related engineering, regulatory affairs, and energy systems operations, management, and compliance including coal-fired plant operations and compliance. I am a Board Certified Environmental Engineer through the American Academy of Environmental Engineers and Scientists,

where I served as a member of the Board of Trustees from 2010 through 2015. I am also a licensed professional engineer. My resume and list of publications are included as Exhibit DJW-1.

Q. HAVE YOU SERVED IN LEADERSHIP ROLES RELATED TO THE ENGINEERING PROFESSION?

A. Yes. I served in various state and national positions with the National Society of Professional Engineers ("NSPE"). I served as president of NSPE from 2012 to 2013 and served on the Board of Directors for eight years. I also served as president of the Texas Society of Professional Engineers from 2002 to 2003. From 2017 to 2018, I served as President of the Engineers' Week Foundation Board of Directors. Since 2015, I have chaired NSPE's Committee on Policy and Advocacy, which develops policy and position statements on key issues affecting licensed engineers across the country. My committee and I recently rewrote the organization's professional policies for Energy and Environment along with eight other policies.

Q. HAVE YOU SERVED IN LEADERSHIP ROLES OUTSIDE OF YOUR PROFESSION?

A. Yes. I retired from the Air Force Reserve in 2002 at the rank of Colonel. I served nine years on active duty and 21 years in the reserves. The majority of my active duty was spent in communications maintenance and operations culminating in a stint as commander of a unit on a mountaintop in Central Turkey. When I transferred to the reserves, I joined a combat civil engineering squadron as chief of utilities and structures. From 1996 to 2002, I returned to environmental and civil engineering first as Senior Individual Mobilization Augmentee ("IMA") to the Environmental Director for the Ogden Air Logistics Center,

then as Senior IMA to the Commander of the Civil Engineering Group at Hill Air Force Base ("AFB"), finishing my career as Senior IMA to the Command Civil Engineer of Air Force Materiel Command. At Hill AFB, I advised senior leadership on issues related to pollution plume remediation and interfaced with the Utah environmental regulators on air permitting and emissions from engines at the base.

Q. PLEASE DISCUSS YOUR COAL COMBUSTION RESIDUALS EXPERIENCE.

A. My coal combustion residuals experience includes the initial startup and testing of fly ash removal, storage, and disposal facilities when I was plant engineering supervisor at Oklaunion Power Station, a 720 MW coal-fired plant near Vernon, Texas from 1985 to 1990. When I served as manager of environmental services for West Texas Utilities Company, from 1991 to 1995, I chaired the Solid Waste Task Force for the Electric Reliability Council of Texas from 1994 to 1995 and participated in the Texas Coal Ash Utilization Group from 1993 to 1995. When I became chief engineer of Texas Natural Resource Conservation Commission in 1995, I led the resolution of coal ash beneficial reuse issues between the state's various electric utilities and the agency's solid waste program management and policy staff. I have also delivered a paper, "Regulatory Advances in Texas," Workshop on Coal Combustion Products, American Coal Ash Association. In the paper, I delineated the results of work between the agency and industry to further define and expand beneficial reuses of coal ash.

Q. HAVE YOU GIVEN TESTIMONY BEFORE?

A. Yes. I filed direct testimony before the South Carolina Public Service Commission on behalf of the South Carolina Office of Regulatory Staff in the matter of Docket No. 2018-319-E on February 25, 2019. I also filed direct testimony and testified before the

North Carolina Utilities Commission in No. E-7 Sub 1146 on January 23, 2018 and in Docket No. E-2 Sub 1142 on December 4, 2017. Recently, I also offered testimony before the Texas State Office of Administrative Hearings, Docket No. 473-14-2252, PUC Docket No. 42087, and before the Florida Public Service Commission, Docket No. 150075-EI.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. BY WHOM HAVE YOU BEEN RETAINED IN THIS PROCEEDING?

A. GDS has been retained by the South Carolina Office of Regulatory Staff ("ORS").

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to address the certain issues regarding Duke Energy Carolinas, LLC's ("DEC" or "Company") and Duke Energy Progress, LLC's ("DEP") (collectively the "Companies") management of their Coal Combustion Residuals (CCR) impoundments including any related legal, regulatory, and cost consequences stemming from that management including:

1) The evolution of coal ash management and its regulations;
2) The evolution of the Coal Combustion Residuals Final Rule;
3) Company History & Current Activities;
4) North Carolina's Coal Ash Management Act ("CAMA") History;
5) A determination whether the Company met environmental compliance and/or best engineering/environmental management practices and if not, whether any resulting cost consequences were either avoidable or unreasonably high; and
6) A determination of the extent and timing of ash removal and other compliance costs attributable solely to North Carolina's CAMA or North Carolina court decisions.

Q. WHAT COAL ASH MANAGEMENT MATERIAL DID YOU REVIEW AND RELY ON TO DEVELOP YOUR TESTIMONY?

A. My review included:

- Information gained from site visits to DEP's Asheville ("Asheville"), Cape Fear ("Cape Fear"), H.F. Lee ("H.F. Lee"), Mayo ("Mayo"), Robinson ("Robinson"), Roxboro ("Roxboro"), Sutton ("Sutton"), and Weatherspoon ("Weatherspoon") Steam Stations in North and South Carolina and associated CCR facilities;
- DEP responses to data requests addressing the Company's past and current coal combustion residual practices at each applicable Company facility;
- Inspection reports related to dam safety of CCR impoundments:
- Remediation options analyses;
- Ash Pond Closure plans;
- Testimonies of Company officials and representatives before the South Carolina Public Service Commission ("Commission") related to these matters;
- Relevant Court Orders, including but not limited to Federal and State Orders related to the Company's failure to comply with Federal and State laws regarding the management of coal ash prior to the enactment of CAMA;
- Environmental Protection Agency ("EPA") and other governmental reports;
- Utilities Solid Waste Activities Group documents;
- The rationale for the enactment of the federal CCR Rule and the enactment of CAMA contained in those and associated preambles;

- Insurance documents of the Company from 1996 that indicate the Company understood it had a significant legal exposure regarding discharges of pollutants from ash/coal combustion residual ponds at its coal-fired power plants;
- Information and documents provided by the Company in response to data requests;
- Duke Energy's SEC 10-K filings for the years 2008-2016; and
- Minutes of Environmental Review Commission of the North Carolina General Assembly meetings for the years 2010 through 2014.

I also relied on my professional training and experience as a licensed engineer with over thirty (30) years of experience at coal-fired power plants including environmental controls, regulations, and compliance from the diverse perspectives of industry, regulatory agency, and consultant.

Q. PLEASE SUMMARIZE YOUR TESTIMONY IN THIS PROCEEDING.

A. In my testimony, I will lay out the evolution of coal ash management regulations to provide context for the development of the Federal CCR Rules and the North Carolina CAMA. I will also describe the role that the February 2014 spill at Dan River Steam Electric Station played in the development of CAMA. Additionally, I will delineate the CCR management solutions employed by coal-fired power plants generally and DEP specifically.

For more discussion on these jurisdictional allocations, please see ORS witness Seaman-Huynh's testimony regarding cost of service, and specifically the discussion related to jurisdictional allocations. While many of the costs requested by DEP in this case resulted from the necessity to comply with the federal CCR Rules or with requirements established by South Carolina authorities and have been recommended for recovery, some

or all the expenses sought by DEP for compliance at Asheville, Cape Fear, H.F. Lee, Sutton, and Weatherspoon result solely from CAMA or the North Carolina Mountain Energy Act of 2015 and South Carolina ratepayers haven't traditionally had to pay for costs incurred solely as a result of North Carolina laws.

Please note that, while I reviewed the CCR expenses (for both Asset Retirement Obligation ("ARO") and non-ARO) provided by DEP through December 31, 2018 and forecasts beyond that time, my recommendations for allowances and disallowances are based on the actuals for ARO deferrals submitted by DEP in Kerin Exhibit 10 (see Exhibit DJW-3.1.2) and Non-ARO Expenses in DEP Schedule 1803 (see Exhibit DJW-3.5.1) through September 30, 2018. Any deferral amounts beyond that date should be addressed in a subsequent proceeding.

Regarding the non-ARO expenses claimed in Schedule 1803 (Exhibit DJW-3.5.1), the data for DEP non-ARO expenses lacks granularity sufficient to do a detailed analysis of these costs. However, the $6,279,603 claimed through September 30, 2018 appears reasonable and I recommend it be allowed. Any non-ARO expenses beyond that date should be addressed in a subsequent proceeding.

Tables 5.2 and 5.4, below, summarize what is being sought for recovery, my recommended disallowances, and the premise on which these recommendations are based. I recommend that the Commission disallow $333,480,308 of the $635,040,092[1] in ARO deferrals being requested by the Company in this proceeding.

[1] This number includes $202,062,063 of spend from 01/01/15 through 06/30/16, requested in Docket No. 2016-227-E, and recovered by DEP pursuant to a Settlement Agreement approved in Commission Order No. 2016-871. Pursuant to Order No. 2016-871 and the Settlement Agreement, "inclusion of certain coal ash expenses in [that] case has no precedential effect and will not prejudice the position of any Party in any future proceeding before the Commission."

III. EVOLUTION OF COAL ASH MANAGEMENT REGULATIONS

Q. HOW DID COAL ASH MANAGEMENT AND ITS REGULATIONS EVOLVE?

A. Federal Surface Water and Wastewater Regulations – The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution. Growing public awareness and concern for controlling water pollution led to sweeping amendments in 1972. As amended in 1972, the law became commonly known as the Clean Water Act ("Clean Water Act"). Wastewater from steam electric power generating units is regulated under the Clean Water Act National Pollutant Discharge Elimination System ("NPDES").

The 1972 Clean Water Act established the basic structure for regulating pollutant discharges into the waters of the United States and gave the EPA the authority to implement pollution control programs such as setting wastewater standards for the electric utility industry based on the fact that CCRs and coal ash wastewater are pollutants. The Clean Water Act maintained existing requirements to set water quality standards for all contaminants in surface waters and made it unlawful for any person to discharge any pollutant from a point source into navigable waters unless a permit was obtained under its provisions.

In accordance with 40 CFR 122.41, the following standard conditions are incorporated into all NPDES permits:

- **Duty to comply**. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (see 40 CFR 122.41(a))

- **Duty to mitigate.** The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. (see 40 CFR 122.41(d))
- **Proper operation and maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit. (see 40 CFR 122.41(e))
- **North Carolina Groundwater (2L) Rules** – In 1979, North Carolina established rules (2L Rules) to protect, maintain, preserve, and enhance the quality of the groundwaters of the State, prevent and abate pollution and contamination of the waters of the state, and to protect public health. These rules require that all entities, including the utility industry, conducting or controlling an activity resulting in the discharge of a waste or hazardous substance to the groundwaters of the State take immediate action to terminate and control the discharge, mitigate any hazards resulting from exposure to the pollutants and notify the Department of Environmental Quality of any such discharge. If as the result of any entity conducting or controlling an activity not permitted by the North Carolina Department of Environmental Quality ("NC DEQ") which results in an increase in the concentration of a substance in excess of the 2L standards, that entity must implement an approved corrective action plan for restoration of groundwater quality.
- **1979 Los Alamos Report** – In May 30, 1979, the Department of Energy ("DOE") directed the University of California's Los Alamos Scientific Laboratory to prepare a

paper on the topic of the disposal and reclamation of coal and uranium wastes (Exhibit DJW-4.8). The report indicated that there was a growing awareness that the discarded wastes from coal combustion were a serious potential source of surface and groundwater contamination and that the wastes have the potential for causing great environmental damage if not properly handled. Regarding disposal in ash basins, the authors concluded:

The control of contaminated leachates and seepages from disposal ponds for fly ash and scrubber sludge represents, perhaps, the most significant environmental problem facing the southwestern coal and utilities industries. Many trace contaminants that are present in the fly ash or sludge can be mobilized by the waters in the ponds. The transport of contaminants from the disposal ponds into shallow or deep aquifers could result in the degradation of the quality of these waters. Frequently, ash and sludge disposal areas are lined with impermeable materials to reduce the loss of water from them. Nonetheless, careful monitoring of the surface and subsurface effluents from disposal ponds is a necessity in a well-planned disposal and reclamation scheme for coal combustion wastes.

- **1988 EPA Report to Congress -** The EPA submitted its report to Congress on "Wastes from the Combustion of Coal by Electric Utility Power Plants" in February 1988. This report addressed CCR from electric utility power plants, voicing concerns over the "substantial quantities of wastes" produced by these plants because of the "increasing reliance on coal for producing electricity." (see Exhibit DJW-4.6 p ES-2) The report forecasted a growth in the production of coal ash and flue gas desulfurization waste from a combined 80 million tons per year in 1984 to 170 million tons in 2000.

The report also observed that "[t]he primary concern regarding the disposal of wastes from coal-fired power plants is the potential for waste leachate to cause ground-water contamination" from the potentially toxic metals in the ash. (see Exhibit DJW-4.6 p ES-3) Furthermore, the report observed that "[m]ost utility waste management facilities were not designed to provide a high level of protection against leaching." (see Exhibit DJW-4.6 p ES-3) In 1988, only about twenty-five percent (25%) of all facilities had liners of any kind (e.g., clay, synthetic, or composite), although that number had increased to forty percent (40%) of facilities built since 1975. (see Exhibit DJW-4.6 p ES-3)

- **Federal Coal Combustion Residual Rule** – Throughout the evolution of the CCR Rule, beginning with the enactment of the Resource Conservation and Recovery Act ("RCRA") on October 21, 1976 and ending with the EPA publication of a final rule correcting the effective date of the disposal of coal combustion residuals final rule to October 19, 2015, the primary concern expressed in reports to Congress and others was that coal combustion residuals or products posed a growing environmental risk of groundwater contamination if left unattended.

From the beginning of this evolution, the EPA saw the country's increasing reliance on coal as a fuel for electrical power generation as presenting significant environmental concerns, as reflected in its February 1988 "Report to Congress on Wastes from the Combustion of Coal by Electric Utility Power Plants."

On December 22, 2008, a dike used to contain coal ash at the dewatering area of the Tennessee Valley Authority ("TVA") Kingston Fossil Plant in Roane County, Tennessee failed. Approximately 5.4 million cubic yards of coal ash was released into Swan Pond Embayment and three adjacent sloughs, eventually spilling into the main

Emory River channel. The release extended approximately 300 acres outside of the fly ash dewatering and storage areas of the plant.

As a result of this failure, the EPA initiated comprehensive inspections of more than 500 CCR impoundments across the country to determine the condition and risk posed by a dam failure. These inspections took place from 2009 through 2011 and included all of the Company's surface impoundments. Among the risks posed by dam failures are: loss of life, injury to people and wildlife, loss or significant damage to public and private property, environmental damage to wetlands and waterways, and damage to infrastructure such as roads and bridges.

On March 9, 2009, the EPA began mailing information request letters to electric utilities and corporations that had surface impoundments or similar units that contained coal combustion residuals. These letters requested information to assist the EPA in evaluating the structural integrity of these management units.

On June 21, 2010, the EPA proposed regulations under RCRA to address the risks from the disposal of CCRs generated from the combustion of coal at electric utilities and independent power producers. This proposal contained two (2) regulatory options, due to the significant and technical policy issues involved in regulating these wastes. Under the first, the EPA proposed to list these residuals as special wastes subject to regulation under Subtitle C of RCRA, when they are destined for disposal in landfills or surface impoundments. Under the second option, the EPA proposed to regulate disposal of such materials under Subtitle D of RCRA by issuing national minimum criteria. Under both alternatives, the EPA proposed to establish dam safety requirements to address the structural integrity of surface impoundments to prevent catastrophic releases. After

extensive study and examination of all comments received during the rulemaking process, the EPA established regulations under Subtitle D of RCRA (Source EPA web site https://www.epa.gov/coalash/coal-ash-rule).

On December 19, 2014, the EPA signed the final rule on disposal of coal combustion residuals from electric power plants. The EPA finalized national regulations providing a comprehensive set of requirements for the disposal of coal combustion residuals as solid waste under subtitle D of RCRA. On April 17, 2015, the EPA published the final rule on disposal of coal combustion residuals from electric utilities in the *Federal Register*. On July 2, 2015, the EPA published a final rule correcting the effective date of the disposal of coal combustion residuals final rule to October 19, 2015.

Q. WHAT WAS THE SIGNIFICANCE OF DEC'S IMPOUNDMENT FAILURE AT DAN RIVER?

A. From February 2, 2014 through February 8, 2014, the unpermitted discharge of approximately 27 million gallons of coal ash wastewater and an estimated 39,000 tons of coal ash into the Dan River occurred through two pipes from Dan River's primary coal ash basin. The coal ash from the release traveled more than 62 miles down the Dan River. Until this event, the draft federal CCR Rule was the driving force in coal combustion residual remediation and closure, and the proposed CCR Rule provided latitude in remediating or closing coal combustion residuals impoundments. The Dan River spill, however, played a deciding role in the development of North Carolina's CAMA in its present form, not only accelerating the timing of action required, but also limiting the options to remediate and close coal combustion residuals impoundments more than would eventually occur under the CCR Rule. In fact, Dr. Wright on page 17, lines 5-7 of his

testimony (see Exhibit DJW-3.6), says that there is no doubt that the Dan River spill certainly helped prompt the North Carolina General Assembly to examine the State's and national coal ash disposal policies and regulations.

As is demonstrated by DEC's own admissions and the Court's findings in the federal criminal actions, criminal negligence on the part of DEC at Dan River and Riverbend and state environmental rule violations at Dan River and Riverbend, as well as DEP's Asheville, Cape Fear, and H.F. Lee plants resulted in damage to the environment. Specifically, DEP "failed to maintain the riser structures in two of the coal ash basins at the Cape Fear Steam Electric Plant, resulting in the unauthorized discharge of leaking coal ash wastewater into the Cape Fear River." In addition, DEP allowed unauthorized discharges via "seeps" from ash basins into waters of the US at the Asheville and H.F. Lee Stations. The seeps were "naturally occurring" and channeled to engineered drains, ditches, and waters of US (see Section II of Exhibit DJW -5.0). In state court lawsuits, DEP was also charged with excavating the CCR, placing the CCR in a compliant landfill or reused beneficially, and achieving compliance with the State's 2L Groundwater Rules (see Exhibit DJW-5.3.1 Items 44 to 71). In addition to language contained within North Carolina's CAMA and legislative drafts of what eventually became CAMA, the court cases and subsequent plea agreements (see Exhibits DJW-5.1 – DJW-5.4) demonstrate that DEC and DEP were criminally and civilly negligent in their operations and maintenance of the impoundments for years prior to the enactment of CAMA, confirming that DEC and DEP failed to responsibly address and correct these issues adequately -- and consequently in a much less costly – manner than it is currently being required to do.

Q. HAVE THERE BEEN ANY SUBSEQUENT LEGAL ACTIONS THAT WOULD CAUSE THE EPA TO ALTER THE WAY CLOSURE WAS OR WILL BE HANDLED AT SITES THAT WERE INACTIVE AS OF APRIL 17, 2015? IF SO, PLEASE EXPLAIN.

A. Yes. On August 21, 2018, the DC Circuit Court found that the EPA had allowed utilities to close inactive ponds at coal plants which were shut down on or before April 17, 2015 to be capped in place without regard to whether the ponds were excavated, dewatered, or lined in some way so as to prevent contamination of groundwater by the inactive pond. The Court remanded the portion of the rule on inactive ponds at inactive sites to the EPA for reconsideration. However, until this issue has been addressed by the EPA, the current CCR Rules remain in effect.

Q. DID THE COMPANY'S ACTIONS IMPACT THE ENACTMENT OF CAMA IN ANY WAY? IF SO, PLEASE EXPLAIN.

A. Yes. In the aftermath of the 2008 CCR impoundment failure at TVA's Kingston Fossil plant and after the EPA's dam safety inspections of DEC's and DEP's coal-fired power plants in 2009, the Federal initiatives on CCR Rule development became the driving force in changes to coal ash management. Environmental lawsuits filed in State Courts in 2013 and 2014 brought issues associated with seepage, unpermitted discharges, groundwater violations, and drinking water impacts from Asheville and Sutton to the forefront. However, it was DEC's February 2014 impoundment failure at Dan River causing a release of as much as 39,000 tons of CCR and 27 million gallons of CCR wastewater into the Dan River that brought a prompt response by the North Carolina

General Assembly as reflected in the preamble of an early May 14, 2014 version (see Exhibit DJW-4.4) of the Coal Ash Management Act (Senate Bill 729) which states:

> Whereas, the issue of coal ash storage has not been adequately addressed in North Carolina for more than six decades; and
>
> Whereas, on February 2, 2014, an estimated 39,000 tons of coal ash was released into the Dan River following the failure of a stormwater pipe under a utility coal ash impoundment pond in Eden, North Carolina; and
>
> Whereas, the Department of Environment and Natural Resources ("Department") finds that coal combustion products have settled into the sediment of the river bottom and will require an extensive clean-up plan to complete remediation; and
>
> Whereas, the Department is in the process of reassessing previous efforts at achieving compliance at coal ash facilities and developing short term and long term policies in light of the Dan River spill, violations discovered in light of increased inspections of coal combustion products disposal facilities and anticipated new federal regulations on coal combustion products; and
>
> Whereas, it is the intent of the Department to ensure that spills of wastewater are reported to the Department in a defined and adequate time frame; and
>
> Whereas, it is the intent of the Department to protect surface water and groundwater resources for their best usage; and
>
> Whereas, it is the intent of the Department to ensure that all unpermitted wastewater discharges are eliminated or addressed in an environmentally responsible manner; and
>
> Whereas, it is the intent of the Department to equally subject all dams under jurisdiction of G.S. 143-215.23 to the requirements of statute and administrative code; and
>
> Whereas, it is the intent of the Department for the owners of all dams under jurisdiction of G.S. 143-215.23 deemed intermediate and high hazard by the Department to prepare at their own cost documents that describe full and adequate response to emergency situations at their dams and to submit those documents to the Department; and
>
> Whereas, it is the intent of the Department to ensure that emergency situations at dams are reported to the Department in a defined and adequate time frame; and

> Whereas, the it is the intent of the Department to increase oversight of dam structure integrity to protect the health and safety of the public; and
>
> Whereas, state law exempts coal combustion products removed from impoundments from being defined as a solid waste; and
>
> Whereas, the Department finds that consistent environmental standards should apply to coal combustion products removed from impoundments for management or disposal and coal combustion products managed or disposed of as a solid waste; and
>
> Whereas, the Department finds the federal Environmental Protection Agency is under consent decree to complete new regulations by December 2014 for coal combustion products that are proposed to bring consistency to requirements for large fills such as structural fills and landfills; and
>
> Whereas, the Department finds that conversion and closure of coal ash storage ponds is necessary for protection of the health and safety of the public;
>
> While the sentiment expressed in this document leaves no doubt in my mind that the spill from Dan River was the seminal event in stimulating the development of CAMA, the other examples of ash mismanagement also played a role in making CAMA as stringent as it became. As is demonstrated by the Company's own admissions and the Court's findings in federal criminal actions, criminal negligence on the part of the Company at Cape Fear, H.F. Lee, Asheville, Cliffside, and Sutton (see Section IV of Exhibit DJW-5.0 Items 98 to 192) resulted in damage to the environment. All of these negligent actions on the part of the Company played a significant role in making CAMA more prescriptive and more stringent than enabling state environmental laws had been in North Carolina for a number of years immediately preceding its enactment.

Q. WAS THE NORTH CAROLINA GENERAL ASSEMBLY CONSIDERING LEGISLATION TO REGULATE COAL ASH DISPOSAL PRIOR TO THE DAN RIVER SPILL?

A. As noted in the preamble to CAMA included earlier in my testimony, the General Assembly acknowledged that the "issue of coal ash storage has not been adequately addressed in North Carolina for more than six decades." In addition, my research of the minutes of the Environmental Commission of the North Carolina General Assembly for the three (3) years prior to the Dan River spill and the month immediately preceding the spill led me to conclude that no legislation was being seriously considered up until the time of the failure. In fact, the only mentions of coal ash in the minutes from February 2010 through January 2014 were as follows:

> January 18, 2011
>
> Ms. Sullins said the effect of coal ash on groundwater was being reviewed as part of the renewal of permits for groundwater. Concerning the issue of coal ash, the EPA issued new [draft] rules for coal combustion residuals [in 2010] after the failure of an impoundment in Tennessee. Because of the types of containment of the residuals, the North Carolina Division of Waste Management, Division of Water Quality and the Division of Land Resources are severally involved in this issue. The three Divisions reviewed the EPA rules and submitted comments to the federal agency. The Division considers the EPA rules unsatisfactory, therefore the Division seeks to have EPA treat coal combustion residuals as solid waste and provide states with financial incentives to regulate them as solid waste to recognize state permitting requirements for the substances.
>
> Representative Harrison asked if the Division felt confident that toxins contained in recycled coal ash remained inert. Mr. Matthews said that the technical standards for hazardous and solid waste are similar and should be effective.
>
> December 13, 2012
>
> Representative Samuelson asked about the differences in types of landfills, specifically industrial landfills. Mr. Scott explained that sanitary landfills include municipal solid waste landfills, construction demolition landfills, and industrial landfills. In North Carolina, there are 16 industrial landfills, mostly for the power industry, coal ash, pulp and paper, and one specifically for battery products.
>
> October 9, 2013

Representative Harrison wanted more information on the coal ash ponds and potential groundwater contamination by the power companies? Mr. Gillespie explained that North Carolina has filed a lawsuit against the power companies on this issue and the Southern Environmental Law Center has joined the suit. DENR has followed the guidelines when imposing fines on Progress Energy. The penalty DENR has imposed is five times higher than normal.

Q. HAS SOUTH CAROLINA PASSED LEGISLATION SIMILAR TO CAMA?

A. No. In fact, SC Code Regs 61-79.261 establishes regulations for CCR impoundments as exempt from solid waste designation. A table of my research into state-specific rules on CCR management and impoundments is included as Exhibit DJW-4.7.2 which shows that, in the region around North Carolina, Kentucky, West Virginia, and Georgia adopted the Federal CCR Rules. That said, on January 24, 2019, the State of Virginia reached a bipartisan agreement to move forward on a bill that would require Dominion Energy to excavate all the coal ash at their Virginia coal plants. See Exhibit DJW-9.1.

Q. HAVE YOU PREPARED A COMPARISON OF THE REQUIREMENTS CONTAINED WITHIN THE EPA'S CCR RULE AND CAMA?

A. Yes. Exhibit DJW-4.7.1 is a side-by-side comparison of the Federal CCR Rule, CAMA, and subsequent amendments. Table 4.1 in Exhibit DJW-4.7.1 summarizes and compares the provisions of CAMA and the CCR Rule. As indicated in the narrative below, CAMA is significantly more restrictive and stringent than the federal CCR Rule.

1) CLOSURE MANDATES. From this side-by-side comparison, it is readily apparent that CAMA focuses on basin closure for any impoundment not rated as "low risk" compared to the CCR Rule. CAMA requires closure only for active basins which cannot meet the various safety and environmental criteria, with a high priority on the stability evaluation. While none of the DEP impoundments were originally listed as

"low risk" under CAMA, the Company was able to change the classifications of impoundments at Mayo and Roxboro by providing a water supply or water treatment system to neighboring communities) on ground water (see Exhibit DJW-8.5). Kerin's Exhibit 10 (Exhibit DJW-3.1.2) indicated that DEP has removed $3,144,456 in "CAMA-related" from this request for reimbursement. See Table 3.1 below. We concur that these costs should not be reimbursed and nor should other "CAMA-related" costs that result from rules that are more stringent than the Federal CCR Rules.

Table 3.1: DEP Changes in Risk Classifications and Drinking Water Supply Spends

Plant	Basin	Risk Classification May 18, 2016	Risk Classification Nov 14, 2018	CAMA Water Supply Costs (source - discovery response 9-06)
Asheville	1964 Ash Basin	High	no change	$186,054
	1982 Ash Basin	High	no change	
Cape Fear	1956 Ash Pond	Intermediate	no change	$11,756
	1963 Ash Pond	Intermediate	no change	
	1970 Ash Pond	Intermediate	no change	
	1978 Ash Pond	Intermediate	no change	
HF Lee	Active Ash Pond	Intermediate	no change	$603,002
	Polishing Pond	Intermediate	no change	
	Ash Pond #1	Intermediate	no change	
	Ash Pond #2	Intermediate	no change	
	Ash Pond #3	Intermediate	no change	
Mayo	Ash Pond	Intermediate	Low	$334,703
Roxboro	East Ash Pond	Intermediate	Low	$1,697,802
	West Ash Pond	Intermediate	Low	
Sutton	1971 Ash Pond	High	no change	$156,699
	1984 Ash Pond	High	no change	
Weatherspoon	Ash Pond	Intermediate	no change	$154,440
			TOTAL	**$3,144,456**

2) CLOSURE METHODS. CAMA allows only "low risk" coal combustion residuals basins to be closed by cap in place while the CCR Rule allows for cap-in-place closure for a wider range of impoundments.

3) COMPLIANCE TIMING. CAMA directs accelerated timelines for compliance in comparison to the CCR Rule. Many of the expenditures for which DEP is seeking recovery in this proceeding would not be required until a number of years in the future, and others not required to be incurred had CAMA not been passed in reaction to the Dan River spill. At Asheville and Sutton, CAMA originally required closure by August 1, 2019. Asheville's CAMA compliance date was extended to 2022 to accommodate the construction of gas-fired combined cycle replacement energy on site in accordance with the North Carolina Mountain Energy Act of 2015. Sutton, on the other hand, was left with the original compliance date. At Asheville, 4.1 million tons of ash were beneficially reused as structural fill at the Asheville airport. Additionally, 233 thousand tons of CCR were hauled to the DEC Cliffside Landfill and 1.7 million tons were hauled from Asheville to a landfill in Homer, Georgia. At Sutton, the ash ponds were decanted, dewatered, excavated (using hydraulic dredges in the later stages), and stacked out on site. Because of the timeline involved with permitting a lined on-site landfill, DEP shipped 2 million tons of the CCR by rail or truck to the Brickhaven Mine to achieve the required CAMA scheduled completion at considerable cost in excess of what DEP would have been required to incur.

4) APPLICABILITY TO INACTIVE SITES. Because the CCR Rule currently applies only to sites that were active as of October 19, 2015. Cape Fear was not impacted by the CCR Rule and was designated for closure under CAMA.

5) BENEFICATION REQUIREMENTS. A North Carolina court order and CAMA require ash beneficiation at three (3) sites. As it relates to CCR and the requirements of CAMA (see Exhibit DJW-4.9), beneficiation is the physical treatment of excavated CCR with suitable chemical properties (e.g., loss on ignition and particle size) so that the processed CCR can be beneficially reused in cementitious products. Two DEP sites, Cape Fear and H.F. Lee, were designated as beneficiation sites. In addition, Weatherspoon was also qualified as a beneficiation site even though the CCR is hauled to cement kilns in South Carolina where it is beneficiated. The Federal CCR Rules do not require beneficiation.

6) CONVERSION TO DRY ASH DISPOSAL. CAMA requires dry fly ash disposal by December 2018 and dry bottom ash disposal by December 2019. The CCR Rule does not expressly address conversion to dry ash disposal. However, in some cases, conversion is driven by basin closure requirements. Furthermore, the EPA extended timelines to accommodate Steam Electric Effluent Limitations Guidelines that propose to require conversion to dry ash disposal. No such extension has been made available in CAMA.

7) HIGH PRIORITY SITES. CAMA identified two (2) of the Company's facilities, Asheville and Sutton, as "**HIGH PRIORITY**" sites, requiring that the time frame for the removal of all ash and the closure of those sites be further accelerated. As is apparent from Kerin's Exhibit 10 (Exhibit DJW-3.1.2), approximately 71 percent ($440 million out of the total Asset Retirement Obligation ("ARO") 2015-September 30, 2018 expenditures of $635 million) of the monies spent by the Company in 2015-September 2018 were incurred due to an accelerated closure schedule of these two sites.

On May 18, 2016, the NC DEQ released proposed classifications (Exhibit DJW-9.2) for all coal ash ponds in NC, while asking the General Assembly to allow the reconsideration of those classifications in 18 months. Table 3.1 lists the Company's High Priority sites designated by CAMA in 2014 (Asheville and Sutton) that must be closed by August 1, 2019, and proposes the rest be classified as intermediate priority for which closure would be required by December 31, 2024.

On November 14, 2018, the NC DEQ (Exhibit DJW-9.3.) issued another press release which states that none of the DEP impoundments met the low-risk classification criteria set forth in CAMA. That left Cape Fear, H.F. Lee, Mayo, Roxboro, and Weatherspoon with their original intermediate risk ratings.

IV. INDUSTRY AND COMPANY COAL ASH MANAGEMENT

Q. WHAT SOLUTIONS HAS THE INDUSTRY IMPLEMENTED FOR COMPLIANCE AND PROTECTION OF THE ENVIRONMENT FROM THE IMPACTS OF COAL ASH DISPOSAL?

A. Since the 1970's, industry practices have shown a shift away from surface impoundments and towards landfills and from unlined impoundments towards lined waste management units. In the EPA's 1988 and 1999 reports to Congress, the agency observed the percentage of generating units with lined landfills increased from thirty percent (30%) to fifty-seven percent (57%) between 1975 and 1995. Over the same time frame, lined surface impoundments rose from seventeen percent (17%) to twenty-eight percent (28%).

In my experience with coal plants and CCR management, which includes both wet and dry components, liners were placed in new ponds built since the mid-1980's and were

placed in Subtitle D compliant landfills built since the mid-1990's. Table 4.1 below illustrates the Company's CCR handling and disposal methods employed at their facilities.

Table 4.1: Coal Ash Disposal Basins at Duke Energy Progress Coal Fired Power Plants

Plant	Coal Plant Size (MW)	Basins	Combined Basin Surface Area (acres)	Basins Built	Lined (Y/N)	Type and Thickness Liner	Type of Disposal (Wet/Dry)	Total Ash Impounded (million tons)	NDPES Permit
Asheville (NC) Steam Electric Generating Session (operating)	376	2	91	1964 and 1982				3.163	NC0000396
		A-1	45	1964	N	N/A	Wet	2.536	
		A-2	46	1982	N	N/A	Wet	0.627	
Cape Fear (NC) Steam Electric Plant (retired)	316	5	160	1956 (I), 1963 (I), 1970 (I), 1978 (I), and 1985 (I)				5.67	NC0003433
		CF-1	12	1956 (I)	N	N/A	Wet	0.42	
		CF-2	21	1963 (I)	N	N/A	Wet	0.76	
		CF-3	30	1970 (I)	N	N/A	Wet	0.84	
		CF-4	37	1978 (I)	N	N/A	Wet	0.83	
		CF-5	60	1985 (I)	N	N/A	Wet	2.82	

Table 4.1: Coal Ash Disposal Basins at Duke Energy Progress Coal Fired Power Plants

Plant	Coal Plant Size (MW)	Basins	Combined Basin Surface Area (acres)	Basins Built	Lined (Y/N)	Type and Thickness Liner	Type of Disposal (Wet/Dry)	Total Ash Impounded (million tons)	NDPES Permit
H.F. Lee (NC) Steam Electric Plant (1951-2012, retired)	382	4	295	4 Inactive (late 1950's through early 1960's and 1 in late 1970's)				5.89	NC0003417
		HFL-1	76	1950	N	N/A	Wet	0.19	
		HFL-2		1955	N	N/A	Wet	0.44	
		HFL-3	87	1962	N	N/A	Wet	0.67	
		HFL-4	132	1982	N	N/A	Wet	4.59	
Mayo (NC) Steam Electric Plant (operating)	727	1	140	1983				6.35	NC0038377
		M-1	140	1983	N	N/A	Wet	6.35	
Robinson (SC) Steam Electric Plant (retired)		1	75	1960 fill area and Ash Basin				3.9	SC0002925
		RSC-1	75	1960	N	N/A	Wet	3.9	
Roxboro (NC) Steam Electric Plant (operating)	2,417	2	374	1966 and 1989				19.42	NC0003425
		R-1	134	1965	N	N/A	Wet	6.96	
		R-2	240	1973	N	N/A	Wet	12.46	
Sutton (NC) Electric Plant (retired)	575	2	139	1971 (unlined) and 1984 (12" clay) plus Lay of Land Area and				7.152	NC0001422
		S-1	54	1971	N	N/A	Wet	3.54	
		S-2	85	1984	Y	12" Clay	Wet	2.78	
Weatherspoon (NC) Steam Electric Plant (retired)	171	1	52	Began ops in 1949. Two coal units added in				1.53	NC0005363
		W-1	52	1979	N	N/A	Wet	1.53	
TOTAL	4,964	18	1,326					53.075	

Q. HAS THE COMPANY KEPT PACE WITH THE REST OF THE INDUSTRY IN ITS COMPLIANCE WITH ITS PERMITS AND WITH ENVIRONMENTAL LAWS GOVERNING COAL ASH MANAGEMENT?

A. No. The Company has been disposing of CCR for at least sixty (60) years. The Company built its first coal-fired power plant (Cape Fear) in 1923 and built the first of its currently listed surface impoundments (H.F. Lee Ash Pond Number 1) in 1950. Except for impoundments and landfills built in response to CAMA and the federal CCR Rule the Company did not vary from its established practice of building, expanding, and continuing to utilize unlined wet surface impoundments despite the increasing concerns reported in industry studies, noted above, with potential ground water impacts from CCR impoundment seeps and leachate. During my December 2018 site visits to the eight (8) DEP plants in North and South Carolina, Company officials contended that the flow coming from the seeps is a small fraction of the flow coming out of the ash basin outfalls permitted under NPDES. While this contention appeared to be true, this does not relieve the Company from complying with the terms of its permits. It is also noteworthy that the engineered (constructed) seeps have been included as permitted outfalls in each plant's NPDES permit while non-constructed seeps have been largely addressed through agreed orders for each plant.

Q. PLEASE SUMMARIZE THE CLOSURE OPTIONS CONSIDERED BY THE COMPANY TO ADDRESS ITS CCR IMPOUNDMENTS AND LANDFILLS.

A. There are essentially four options to closing CCR impoundments: (1) Cap-In-Place, (2) Hybrid Closure, (3) Excavate and Landfill On-Site, and (4) Excavate and Dispose of

Off-Site. In addition, there is a process to remove and beneficiate the ash for resale to concrete plants. A description of the closure options follows:

1) OPTION 1: HYBRID CLOSURE – Consists of excavating ash materials from the proposed Closure-by-Removal Areas and the subsequent placement of these ash materials within the proposed consolidated Hybrid Ash Closure Area. Following these excavation and placement activities, the Hybrid Ash Closure Area will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.
2) OPTION 2: CLOSURE-IN-PLACE – Consists of leaving the ash material within the Ash Basin, which will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.
3) OPTION 3A: CLOSURE-BY-REMOVAL TO EXISTING ON-SITE LANDFILL – Consists of the excavating all ash materials from the proposed Closure-by-Removal Area and placing these ash materials in a new phase of liner within the Existing On-Site Landfill. The existing landfill will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.
4) OPTION 3B: CLOSURE-BY-REMOVAL TO EXISTING & NEW ON-SITE LANDFILLS – Consists of excavating ash materials from the proposed Closure-by-Removal Area, placing those ash materials in a new phase of liner within the Existing On-Site Landfill. Once the new Industrial Landfill is permitted and constructed, excavated ash materials from the proposed Closure-by-Removal Area can subsequently be placed within the new Industrial Landfill. The new phase of the existing landfill

and the new Industrial Landfill will be capped with an infiltration barrier/cap system meeting the requirements of the Federal CCR Rule and CAMA.

5) OPTION 4: CLOSURE-BY-REMOVAL TO OFF-SITE THIRD-PARTY LANDFILL – Consists of excavating the entire Ash Basin and the disposal of the ash material in an existing, off-site, and appropriately lined landfill system.

Q. HOW DID THE CAMA RULES IMPACT ASH BASIN CLOSURE COSTS, STRATEGY, AND SCHEDULE?

A. The CAMA rules required accelerated closure schedules for **HIGH PRIORITY** Sites (i.e., Asheville and Sutton) which had the effect of removing cap-in-place as a viable closure strategy at these sites. This, in turn, forced some sites such as Asheville and Sutton, to excavate and ship train and truck loads of CCR from the ash ponds to an off-site landfill as much as 145 miles away. Consequently, the CAMA rules resulted in costs exceeding what would have been the costs under the Federal CCR Rules alone.

V. EXPENDITURES ATTRIBUTABLE ONLY TO CAMA

Q. SHOULD SOUTH CAROLINA RATEPAYERS BE REQUIRED TO REIMBURSE DEP FOR EXPENDITURES INCURRED SOLELY DUE TO NORTH CAROLINA'S CAMA OR NORTH CAROLINA COURT DECISIONS?

A. No. It is the position of ORS that costs incurred as a result of jurisdictional laws should not lead to increased costs to ratepayers outside of that jurisdiction. This matter is addressed in the cost of service testimony of ORS witness Seaman-Huynh.

As identified by DEP witness Kerin, DEP has attempted to isolate specific costs associated with CAMA and is not seeking recovery of those costs from South Carolina ratepayers. However, the costs set aside by DEP largely encompass providing bottled

water or other water supplies. Additional costs above and beyond those identified by DEP solely attributable to CAMA are further identified below. ORS is not taking the position that South Carolina ratepayers should not pay any costs related to environmental compliance and cleanup at DEP's coal fired generation facilities, only that North Carolina law and court decisions, over which South Carolina ratepayers have no meaningful input, should not place an additional burden on the ratepayers of South Carolina.

Q. WHAT TYPE OF EXPENDITURES HAVE YOU IDENTIFIED AS BEING SOLELY ATTRIBUTABLE TO CAMA?

A. I have identified the following types of expenditures as being solely attributable to CAMA and not the Federal CCR rules:

1) Expenditures for plants and impoundments not covered at all by the CCR rules. For DEP, Cape Fear falls into this category.
2) Expenditures for closure and/or excavation options not required under the CCR Rules, but required under CAMA or North Carolina court decisions. Asheville, Cape Fear, H.F. Lee, Sutton, and Weatherspoon fall in this category.
3) Expenditures for actions that would not have been required at this time under the CCR rules, but are subject to **accelerated schedules** under CAMA or other state law. Sutton and Asheville fall into this category.

Q. WHAT TYPE OF EXPENDITURES DO YOU CONSIDER TO BE FULLY RECOVERABLE?

A. Prudently incurred expenditures for actions which are required by and fulfill the Federal CCR Rules or the requirements of the State of South Carolina. Mayo, Roxboro, and Robinson fall into this category.

Q. WHICH, IF ANY DEP PLANTS ARE NOT COVERED BY THE FEDERAL CCR RULES?

A. Company witness Kerin's Exhibit 10 (Exhibit DJW-3.1.2) states "Cape Fear is not currently subject to CCR provisions regarding basin closure." While witness Kerin goes on to state "[h]owever, in response to the United States Court of Appeals for the District of Columbia Circuit's August 21, 2018 decision in *USWAG vs. EPA* (No. 15-1219), the EPA is expected to undertake a rulemaking that would regulate inactive impoundments at closed power plants, including the Cape Fear basin", this statement is irrelevant to this proceeding because the EPA has not yet issued its final ruling.

Q. WOULD THE REGULATION OF INACTIVE INPOUNDMENTS NECESSARILY LEAD TO THE FORCED CLOSURE AND/OR EXCAVATION OF THE CAPE FEAR IMPOUNDMENTS IN A MANNER SIMILAR TO THAT DIRECTED BY CAMA?

A. No. Any speculation as to what regulations the EPA will issue in response to the Court Order is solely that – speculation – and should not be considered in this proceeding.

Q. HOW MUCH HAS DEP REQUESTED IN THIS PROCEEDING FOR THE RECOVERY OF EXPENDITURES AT CAPE FEAR?

A. As noted in Table 5.1, below, the Company is requesting the recovery of $33,631,199 for specified actions (see Exhibit DJW-3.1.2) at Cape Fear. This entire amount should be disallowed for recovery from South Carolina ratepayers absent any federal regulations directing the actions taken by DEP or for any similar actions.

Q. WHAT EXPENDITURES FOR CLOSURE AND/OR EXCAVATION OPTIONS NOT REQUIRED UNDER THE CCR RULES, BUT REQUIRED UNDER CAMA, HAS THE COMPANY REQUESTED IN THIS PROCEEDING?

A. The actions covered by the Company's request are summarized in Kerin Exhibit 10 (Table 5.1) (Exhibit DJW-3.1.2), below (copied from DEP's response to SCORS DEP 10-08) delineates the CCR costs being requested by the Company in their filing in the column labeled "Total Costs Incurred 1/1/15 -9/30/18":

Table 5.1: DEP Actual and Projected ARO Cash Flows 2015-2018

	Total Project Costs (2015+)	Total Costs Incurred 1/1/15 - 9/30/18	2015	2016	2017	1/1 - 9/30/18	Total CF Forecast	10/1 - 12/31/18
DEP								
Operating								
Asheville	$ 452,038,793	$ 191,934,196	$ 24,187,676	$ 82,788,175	$ 40,931,030	$ 44,027,315	$ 260,104,597	$ 22,261,993
Mayo	206,749,586	25,384,168	7,342,989	7,524,374	5,880,434	4,636,371	181,365,418	9,165,451
Roxboro	349,803,401	34,070,691	7,806,769	12,563,556	7,167,110	6,533,256	315,732,710	6,366,469
Total Operating Plants	1,008,591,780	251,389,055	39,337,434	102,876,105	53,978,574	55,196,942	749,360,288	37,793,913
Retired								
Cape Fear	504,918,488	33,631,199	7,705,330	8,346,981	6,815,029	10,763,860	471,287,289	18,325,181
HF Lee (NC)	568,383,919	54,775,180	7,260,508	13,498,675	13,416,419	20,599,578	513,608,739	21,923,632
Robinson (SC)	179,561,777	11,431,675	2,581,604	3,834,014	2,090,145	2,925,911	168,130,102	10,866,681
Sutton	493,219,171	255,525,554	37,189,549	79,669,346	104,689,533	33,977,126	237,693,617	19,844,924
Weatherspoon	209,724,346	28,287,429	4,631,236	4,489,006	9,438,277	9,728,910	181,436,918	7,036,705
Total Retired Plants	1,955,807,702	383,651,037	59,368,227	109,838,022	136,449,403	77,995,385	1,572,156,665	77,997,123
Total Duke Energy Progress	$ 2,964,399,482	$ 635,040,092	$ 98,705,661	$ 212,714,127	$ 190,427,977	$ 133,192,326	$ 2,329,359,390	$ 115,791,036

As shown in Table 5.2 below, three of the plants (Mayo, Robinson, and Roxboro) are pursuing closure options and schedules in compliance with the Federal CCR Rules, and I recommend that all prudently incurred expenditures for these plants be allowed. In addition, Robinson pursued closure options that were coordinated with and approved by the South Carolina Department of Health and Environmental Control ("DHEC"). I recommend that all prudently incurred expenditures for this plant also be allowed.

Table 5.2: Summary of Closure Options and Recommended Disallowances

Plant	Amount Requested (1/1/15-9/30/18, SCORS DEP 10-08)	Closure Option Compliance with Federal CCR Rules	Recommended Disallowance
Asheville	$ 191,934,196	CAMA High Priority - Accelerated Schedule -- Allow Engineering and Planning	$ 98,220,932
Cape Fear	$ 33,631,199	No Federal CCR Requirements	$ 33,631,199
HF Lee	$ 54,775,180	Beneficiation - CAMA Only -- Allow Engineering and Planning	$ 9,207,711
Mayo	$ 25,384,168	Federal CCR Compliant	$ -
Robinson	$ 11,431,675	Federal CCR Compliant and SCDHEC Requirements	$ -
Roxboro	$ 34,070,691	Federal CCR Compliant	$ -
Sutton	$ 255,525,554	CAMA High Priority - Accelerated Schedule -- Allow Engineering and Planning`	$ 186,376,226
Weatherspoon	$ 28,287,429	Excavation and Beneficiation Off-Site -- CAMA -- Allow E&P Through 9/30/17 and Half Costs 10/01/17 through 9/30/18	$ 6,044,240
Total	**$ 635,040,092**		**$ 333,480,308**

The three other plants (Asheville, H.F. Lee, and Sutton) shown in Table 5.2 were compelled by the provisions of CAMA or the North Carolina Mountain Energy Act to act faster (Sutton) or take actions not required by the Federal CCR Rules (Asheville, H.F. Lee,

Sutton, and Weatherspoon). Asheville and Sutton were designated as **HIGH PRIORITY** sites by CAMA and compelled by CAMA to complete closure by August 2019. From a Federal CCR Rules perspective, Sutton would not have been required to even begin closure until 2020.

Q. REGARDING H.F. LEE, WHAT EXPENDITURES FOR CLOSURE AND/OR EXCAVATION OPTIONS NOT REQUIRED UNDER THE CCR RULES, BUT REQUIRED UNDER CAMA, HAS THE COMPANY REQUESTED IN THIS PROCEEDING?

A. As noted in Table 5.1 above, DEP is currently requesting $54,775,180 for costs incurred through September 30, 2018 at H.F. Lee. In his Exhibit 10, Mr. Kerin describes the work completed to date at H.F. Lee as including: "CAMA & CCR wells; dam stability; EHS groundwater & permitting; ash beneficiation; landfill; planning and overheads; bulk dewatering system; dewatering operations; dewatering engineering; wetland delineation report; closure plan development; basin closure engineering". CAMA alone required beneficiation of CCR at several plant sites in North Carolina. As noted above, Cape Fear and H.F. Lee are designated as **INTERMEDIATE PRIORITY** sites under CAMA, and CAMA requires their impoundments to be been addressed through beneficiation, a process not shown as a requirement under the Federal CCR Rules. Mr. Kerin further observes in several instances that "Engineering and project planning at the current time are needed to synchronize work between all of the coal ash sites being closed in the next 20 years, as well as to gain synergies between excavation/capping plans for all the sites." I concur with this assessment. However, these added costs should only be imposed on South Carolina ratepayers when the actual construction work associated with each site is attributable to the

CCR rules only and not due to schedule or scope changes imposed by CAMA. DEP's beneficiation project at H.F. Lee clearly falls under the "CAMA-only" category, and the ratepayers of South Carolina should not have to reimburse the Company for expenses related to the CAMA-only beneficiation requirement.

Q. WHAT PORTION OF DEP'S CLAIMED EXPENDITURES AT H.F. LEE SHOULD BE ALLOWED IN THIS PROCEEDING?

A. In reviewing the Company's actual and projected costs laid out in Kerin Exhibit 10 (Exhibit DJW-3.1.2), and other information provided through discovery, I observed that DEP has not described the costs claimed for H.F. Lee in enough granularity to determine which and how much of the costs incurred at H.F. Lee are associated with appropriate engineering and planning activities, Federal CCR Rules compliance, and compliance with CAMA or other state only requirements. To arrive at a good-faith estimate of engineering and planning costs associated with impoundment closures, I assumed that engineering and planning activities at all eight (8) DEP coal-fired power plants were accomplished at the same time between 2015 and 2017. As I previously noted, Table 5.3 below includes the data from DEP's response to ORS Discovery Request 10-08 (Exhibit DJW 3.4) used to estimate engineering and planning as a percentage of engineering and planning costs.

During my December 2018 site visit to H.F. Lee, I learned that the beneficiation plants are to be built and commissioned between 2019 and 2021. Out of spec ash will be landfilled off-site and qualifying ash will largely be sold to concrete plants. Based upon this information and my observations during my site visit, I concluded that most of the costs incurred in 2018 appear to be related to beneficiation efforts and not compliance with the Federal CCR Rules. For this reason, I recommend disallowing the difference between

the 2018 spend through September 30 ($20,599,578) and the average of the previous three (3) years $11,391,867 for a total disallowance of $9,207,711.

Q. WHAT EXPENDITURES FOR ACTIONS THAT WOULD NOT HAVE BEEN REQUIRED AT THIS TIME UNDER THE CCR RULES, BUT ARE SUBJECT TO ACCELERATED SCHEDULES UNDER CAMA, HAVE BEEN REQUESTED FOR RECOVERY BY DEP IN THIS PROCEEDING?

A. Kerin Exhibit 10 states "Sutton is subject to the CCR rule provisions requiring basin closure. 40 CFR § 257.102(b) required a written closure plan by October 17, 2016. On July 6, 2016, the placement of waste streams in the Sutton 1971 Basin and 1984 Basin ceased and closure of the basins commenced pursuant to 40 CFR § 257.102(e)(1)(i). Pursuant to ¶ 5.e. of the Order Granting Motion for Partial Summary Judgment dated June 1, 2016 (13-CVS-11032), a written Site Analysis and Removal Plan was due by December 31, 2016. Sections 3(b) and 3(c) of CAMA require excavation of the Sutton basins, with the ash disposed of in either an off-site or on-site landfill. (Sutton is a high-priority site, with ash basin closure required by August 1, 2019.)"

Q. DID THE CCR RULE REQUIRE THE CLOSURE OF SUTTON?

A. No. Unlike Asheville where the basins did not meet aquifer and wetland conditions which triggered actions under the CCR Rules, there is no mention of noncompliance in Kerin 10 regarding Sutton. It is therefore reasonable to conclude that the Sutton closure was directed by CAMA and the North Carolina court orders Mr. Kerin mentions in his Exhibit 10. It follows that any subsequent actions performed under the CCR Rules as a result of closing the impoundments at Sutton were the result of DEP's requirements to comply CAMA and North Carolina court orders.

Q. SHOULD SOUTH CAROLINA RATEPAYERS BE HELD RESPONSIBLE FOR REIMBURSING DEP FOR EXPENSES THAT WOULD NOT HAVE BEEN INCURRED AT THIS TIME ABESENT CAMA?

No. It is readily apparent that the CCR rules would not have required closure actions at Sutton to even **commence** until October 31, 2020, while closure is required to be **completed** by August 1, 2019 under CAMA and the noted North Carolina Partial Summary Judgment.

Q. WHAT AMOUNT HAS DEP CLAIMED FOR CLOSURE AND EXCAVATION EXPENDITURES AT SUTTON?

A. DEP has requested recovery of $255,525,554 in this proceeding (see Table 5.1).

Q. ARE YOU CONTENDING THAT THIS ENTIRE AMOUNT SHOULD BE DISALLOWED?

A. No. DEP should be allowed to recover in this proceeding any planning and engineering costs that would have been required for compliance with the CCR Rules as they now stand and should be further allowed to seek recovery after 2020 for prudently incurred actual construction and transportation expenditures related to CCR compliance.

Q. WHY IS IT REASONABLE TO ALLOW DEP TO RECOVER ENGINEERING AND PLANNING COSTS?

A. As Company witness Kerin notes several times in Kerin Exhibit 10 (Exhibit DJW-3.1.2), "Engineering and project planning at the current time are needed to synchronize work between all of the coal ash sites being closed in the next 20 years, as well as, to gain synergies between excavation/capping plans for all the sites." I concur with this assessment. However, the actual construction work associated with each site should only

be allowed if is attributable to the CCR rules only and not due to schedule or scope changes imposed by CAMA.

Q. HOW MUCH OF THE COMPANY'S REQUEST FOR SUTTON WOULD YOU ESTIMATE IS PLANING AND ENGINEERING THAT SHOULD BE ALLOWED FOR RECOVERY IN THIS PROCEEDING?

A. Table 5.3 below includes data from DEP's response to SCORS Discovery Request 10-08 (see Exhibit DJW-3.4) used to estimate engineering and planning as a percentage of engineering and planning costs.

Table 5.3: Estimating Engineering and Planning Costs for DEP Plants

Plant	Cost Data from Company Response to SCORS 10-08		2015	2016	2017	2018 thru 9/30	10/1/18 to 12/31/18
Mayo	Spend to Date	$ 25,384,167.79	$ 7,342,989.00	$ 7,524,374.00	$ 5,880,434.13	$ 4,636,370.66	$ -
	Remaining Current Year Forecast	$ 9,165,450.92	$ -	$ -	$ -	$ -	$ 9,165,450.92
	Total Pre-Construction (E&P)	$ 34,549,618.71					
	Total Project Costs	$ 206,749,586.20					
	Percentage E&P of Total	**16.71%**					
Robinson	Spend to Date	$ 11,431,675.28	$ 2,581,604.00	$ 3,834,014.49	$ 2,090,145.33	$ 2,925,911.46	$ -
	Remaining Current Year Forecast	$ 10,866,680.83	$ -	$ -	$ -	$ -	$ 10,866,680.83
	Total Pre-Construction (E&P)	$ 22,298,356.11					
	Total Project Costs	$ 179,561,777.32					
	Percentage E&P of Total	**12.42%**					
Roxboro	Spend to Date	$ 34,070,691.00	$ 7,806,769.00	$ 12,563,556.00	$ 7,167,110.01	$ 6,533,255.99	$ -
	Remaining Current Year Forecast	$ 6,366,469.49	$ -	$ -	$ -	$ -	$ 6,366,469.49
	Total Pre-Construction (E&P)	$ 40,437,160.49					
	Total Project Costs	$ 349,803,400.59					
	Percentage E&P of Total	**11.56%**					
Weatherspoon	Spend to Date	$ 28,287,428.60	$ 4,631,236.00	$ 4,489,006.00	$ 9,438,276.66	$ 9,728,909.94	$ -
	Remaining Current Year Forecast	$ 7,036,705.16	$ -	$ -	$ -	$ -	$ 7,036,705.16
	Total Pre-Construction (E&P)	$ 35,324,133.76					
	Total Project Costs	$ 209,724,346.36					
	Percentage E&P of Total	**16.84%**					
TOTAL DEP	Spend to Date	$ 99,173,962.66	$ 22,362,598.00	$ 28,410,950.49	$ 24,575,966.13	$ 23,824,448.04	$ -
	Remaining Current Year Forecast	$ 33,435,306.41	$ -	$ -	$ -	$ -	$ 33,435,306.41
	Total Pre-Construction (E&P)	$ 132,609,269.07					
	Total Project Costs	$ 945,839,110.47					
	Percentage E&P of Total	**14.02%**					

The weighted average of engineering and planning as a percentage of total project costs for the three (3) Federal CCR Rules compliant plants (i.e., Mayo, Robinson, and Roxboro) and Weatherspoon which has many elements of CCR compliance was 14.02 percent during the period from 2015 through September 30, 2018. Applying this percentage to DEP's estimated total Sutton project costs ($493,219,171), I estimate that

reasonable engineering and planning activities for the Sutton Steam Electric Station is $69,149,328 from 2015 through September 30, 2018. Based on the limited information provided, I concluded that the remainder of the $255,525,554 requested by DEP in this proceeding was incurred due to the accelerated schedule and other requirements imposed by CAMA on **HIGH PRIORITY** sites. Therefore, I recommend that $186,376,226 of the Company's request for reimbursement at Sutton be disallowed.

Q. WHAT ADDITIONAL REQUIREMENTS WERE IMPOSED BY CAMA AND OTHER ACTIONS ON THE COMPANY'S ASHEVILLE PLANT BY THE STATE OF NORTH CAROLINA?

A. While the timing of compliance actions at Asheville was not impacted by CAMA since the plant's impoundments did not meet federal wetlands and uppermost aquifer restrictions, the extent of the compliance measures required (excavation and removal vs. cap in place) and the costs associated with required measures were much greater than they would have been under CAMA alone.

Q. BASED ON THE INFORMATION AVAILABLE, WHAT DO YOU DETERMINE WOULD HAVE BEEN REASONABLE COSTS INCURRED FOR CCR RULE COMPLIANCE ONLY AT ASHEVILLE?

A. I believe that it would be reasonable for DEP to recover expenses prudently incurred for engineering and planning and for "cap-in-place" disposal of ash at Asheville.

Q. DO YOU BELIEVE IT WOULD HAVE BEEN PRACTICAL TO IMPLEMENT CAP-IN-PLACE AT ASHVILLE ABSENT NORTH CAROLINA LEGISLATION AND REGULATIONS DIRECTING OTHERWISE?

A. Yes. The North Carolina Mountain Energy Act of 2015 required the installation of a natural gas-fired combined cycle facility at Asheville. Had that not been required, there would have been ample room for on-site disposal of ash impounded at Asheville.

Q. HOW HAVE YOU DETERMINED THE AMOUNT OF COSTS WHICH WOULD HAVE BEEN INCURRED BY DEP HAD IT PURSUED A CAP-IN-PLACE OPTION AT ASHEVILLE RATHER THAN EXCAVATING IMPOUNDMENTS AND SHIPPING ASH OFF SITE.

A. To estimate appropriate costs incurred to date for Asheville, I multiplied the estimated total costs per ton (including engineering and planning) estimated by DEP for compliance at Robinson ($169,561,777/3,900,000 tons = $43.48/ton; see Table 5.1 and Table 4.1 above) to the total tons removed through September 30, 2018 at Asheville (2,144,448 tons; SCORS DEP 11-07) to calculate the costs that would reasonably have been incurred under the CCR Rules alone ($93,713,264).

Q. WHY IS IT REASONABLE TO USE ROBINSON COSTS TO APPROXIMATE COSTS REASONABLY INCURRED AT ASHEVILLE?

A. As shown in Table 4.1 above, the total amount of ash expected to be removed from Asheville is 3.163 million tons, while the amount at Robinson is 3.9 million tons, which is to be placed in a separate on-site landfill rather than capped in place. Removal costs at Mayo and Robinson, where much more ash had to be dealt with, were considerably lower on a dollars per ton basis than Robinson, partially due to economies of scale and partially due to the use of a more expensive disposal method. However, since the disposal requirement (in tons) at Asheville most closely resembled that at Robinson, I

conservatively chose the higher dollars per ton amount to apply to Asheville tonnage despite the additional costs imposed by the methodology chosen for Robinson.

Q. WHAT IS YOUR RECOMMENDED DISALLOWANCE FOR ASHEVILLE BASED ON THE CONCLUSIONS STATED ABOVE?

A. I recommend that $98,220,932 of the $191,934,196 requested by DEP in this proceeding be disallowed.

Q. ARE YOU RECOMMENDING ANY DISALLOWANCES FOR CCR COSTS AT WEATHERSPOON?

A. Yes. During my December 2018 site visit, I saw how DEP was addressing the closure of its CCR impoundment at Weatherspoon (see Exhibit DJW-2.8). The closure plan includes the following steps: (a) decant the free or bulk water down to the bottom three feet and maintain this level until dewatering begins; (b) excavate the ash, allow to dry, and screen the ash for size; (c) build piles of material (Active and Reserve); (d) seal the Reserve Pile with EcoGreen; and (e) truck ash from the screened and dry Active Pile to the cement kilns in South Carolina. Once the ash is completely excavated from the impoundments, the bottom will be confirmed for clean closure.

While there are similarities to the processes being employed at sites using excavation and placement in an on-site impoundment, there other aspects of this process which are not required under the Federal CCR Rules. These aspects include (1) screening of the ash for size, (2) building active and reserve piles, and (3) shipping the processed CCR to cement kilns about 150 miles away. DEP has represented efforts at Weatherspoon as beneficiation, which is not required under the Federal CCR Rules but is part of the North Carolina CAMA provisions.

In assessing the calculation of disallowances for Weatherspoon, I sought first to determine the allowance for engineering and planning. Because the excavation work at Weatherspoon began in September 2017 and continues today, I used the total expenditures from 2015 and 2016 as well as three-fourths of the costs in 2017 (see Exhibit DJW-3.4) as a good faith estimate of engineering and planning costs. This came to a total of $16,198,949. To allow for costs that would be required under the Federal CCR Rules, I reviewed the costs submitted in DEP's response to SCORS 10-08 and Kerin Exhibit 10. Unfortunately, this data lacked the granularity to determine how much of the costs were for beneficiation and how much was for work required under the Federal CRC Rules. Therefore, I estimated the allowable Federal CCR Rules work as half of the calculated fourth quarter 2017 expenses and half of the first through third quarters of 2018. This process resulted in an allowance for Federal CCR work of $6,044,240.

Taking the total of calculated engineering and planning ($16,198,949) and Federal CCR work ($6,044,240), I estimated $22,243,189 in allowances for Weatherspoon. I then subtracted this allowance from what DEP spent ($28,287,429 through September 30, 2018 in Exhibit DJW-3.4) at Weatherspoon. As a result, I recommend the difference between the expenditures and the allowance for a total disallowance of $6,044,240 for disallowance. The allowable expenses should be allowed for recovery from South Carolina ratepayers to the extent they were prudently incurred.

Q. ARE THERE ANY DEP PLANTS FOR WHICH YOU RECOMMEND NO DISALLOWANCES?

A. Yes. The "Cap-In-Place" options chosen at Mayo and Roxboro are consistent with the Federal CCR Rules, and North Carolina state law does not impose additional

requirements at these sites. Therefore, the South Carolina pro rata share of the Company's total spend for these two sites should be allowed to the extent they were prudently incurred.

Because Robinson CCR impoundment was closed and remediated pursuant to a negotiated agreement with the South Carolina DHEC, the costs associated with this project should be approved for recovery from South Carolina ratepayers to the extent they were prudently incurred.

Q. HAVE YOU PREPARED A SUMMARY OF YOUR RECOMMENDED DISALLOWANCES?

A. Yes. Table 5.4 below summarizes my recommendations for disallowance in the current request for reimbursement. Of the $635,040,092 currently being requested by the Company for reimbursement, I recommend that the Commission disallow $333,480,308 for recovery from ratepayers.

Table 5.4: Duke Energy Progress Reimbursement Request and Disallowances					
Plant	Cost Data				
	Total Project (from SCORS DEP 10-08)	Amount Requested (1/1/15-9/30/18, SCORS DEP 10-08)	Disallowance	Rationale	Allowance
Asheville	$ 452,038,793	$ 191,934,196	$ 98,220,932	CAMA High Priority - Accelerated Schedule -- Allow what would have been incurred for "Cap-In-Place" only	$ 93,713,264
Cape Fear	$ 504,918,488	$ 33,631,199	$ 33,631,199	No Federal CCR Requirements	$ -
HF Lee	$ 568,383,919	$ 54,775,180	$ 9,207,711	Beneficiation - CAMA Only -- Allow Engineering and Planning	$ 45,567,469
Mayo	$ 206,749,586	$ 25,384,168	$ -	Federal CCR Compliant	$ 25,384,168
Robinson	$ 179,561,777	$ 11,431,675	$ -	Federal CCR Compliant and SCDHEC Requirements	$ 11,431,675
Roxboro	$ 349,803,401	$ 34,070,691	$ -	Federal CCR Compliant	$ 34,070,691
Sutton	$ 493,219,171	$ 255,525,554	$ 186,376,226	CAMA High Priority - Accelerated Schedule -- Allow Engineering and Planning`	$ 69,149,328
Weatherspoon	$ 209,724,346	$ 28,287,429	$ 6,044,240	Excavation and Beneficiation Off-Site -- CAMA -- Allow E&P Through 9/30/17 and Half Costs 10/01/17 through 9/30/18	$ 22,243,189
TOTAL	**$ 2,964,399,482**	**$ 635,040,092**	**$ 333,480,308**		**$ 301,559,784**

Q. ARE YOU RECOMMENDING THAT DEP BE PRECLUDED FROM RECOVERING COSTS DISALLOWED IN THIS PROCEEDING IN FUTURE PROCEEDINGS?

A. Not necessarily. If DEP can demonstrate that it has prudently incurred expenses dictated by compliance with the CCR Rules as they stand at the time of its next rate case, any expenses required by the CCR Rule as a stand-alone document (i.e. absent CAMA) and determined to be prudently incurred should be considered for recovery in that forum.

However, as noted in my testimony above, many of DEP's claimed expenses are not yet ripe for recovery under the CCR Rules as they stand.

Q. WILL YOU UPDATE YOUR TESTIMONY BASED ON INFORMATION THAT BECOMES AVAILABLE?

A. Yes. ORS fully reserves the right to revise its recommendations via supplemental testimony should new information not previously provided by the Company, or other sources, become available.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

OFFICE OF REGULATORY STAFF
DAN J. WITTLIFF, BCEE
EXHIBIT LIST
DUKE ENERGY PROGRESS, LLC
DOCKET NO. 2018-318-E

DJW-1	Resume of Dan Wittliff
DJW-2.1	Site Visit Asheville Plant
DJW-2.2	Site Visit Mayo Plant
DJW-2.3	Site Visit Roxboro Plant
DJW-2.4	Site Visit Cape Fear Plant (NC)
DJW-2.5	Site Visit HF Lee Plant (NC)
DJW-2.6	Sutton Plant (NC)
DJW-2.7	Robinson Plant (NC)
DJW-2.8	Weatherspoon Plant (NC)
DJW-3.1.1	November 8, 2018, Jon Kerin Testimony
DJW-3.1.2	November 8, 2018, Jon Kerin Exhibits 3-8 and 10
DJW-3.2	DEP Response to SCORS Interrogatory 1-22
DJW-3.3	DEC and DEP Response to SCORS Interrogatory 9-06
DJW-3.4.0	Summary and Footnotes of ARO Cash Flows
DJW-3.4.1	Asheville ARO Cash Flows
DJW-3.4.2	Mayo ARO Cash Flows
DJW-3.4.3	Roxboro ARO Cash Flows
DJW-3.4.4	Cape Fear ARO Cash Flows
DJW-3.4.5	HF Lee ARO Cash Flows
DJW-3.4.6	Robinson ARO Cash Flows
DJW-3.4.7	Sutton ARO Cash Flows
DJW-3.4.8	Weatherspoon ARO Cash Flows
DJW-3.5.0	Schedule 1802 submitted by DEP
DJW-3.5.1	Schedule 1803 submitted by DEP
DJW-3.5.2	Schedule 1804 submitted by DEP
DJW-3.5.3	Schedule 1805 submitted by DEP
DJW-3.6	November 8, 2018, Dr. Julius Wright Testimony

OFFICE OF REGULATORY STAFF
DAN J. WITTLIFF, BCEE
EXHIBIT LIST
DUKE ENERGY PROGRESS, LLC
DOCKET NO. 2018-318-E

DJW-3.7	DEP Response to SCORS 31-1 Non-ARO Ash Projects
DJW-4.4	North Carolina Coal Ash Management Act of 2014
DJW-4.5	Mountain Energy Act 2015
DJW-4.6	1988 Report to Congress
DJW-4.7.1	Side-by-Side Comparison of Legal Requirements
DJW-4.7.2	CCR and State Regulations
DJW-4.8	Los Alamos Report
DJW-4.9	CAMA 2016
DJW-5.0	Summary Findings of Fact in DE CCR Impoundments
DJW-5.1	Federal Court Case and Plea Agreement
DJW-5.2	May 14, 2015 Joint Factual Statement
DJW-5.2.1	May 14, 2016 Joint Factual Statement
DJW-5.3.1	June 1, 2016 Four Plant Order and Exhibits
DJW-5.3.2	June 9, 2017 Amended Order Granting Motion for Partial Summary Judgement
DJW-5.4	Subsequent Enforcement Actions – Executed Settlement Agreement
DJW-6	DEP Timeline
DJW-7.1.1	Mayo Closure Options Analysis
DJW-7.1.2	Mayo Analysis
DJW-7.2	Robinson Closure Options Analysis
DJW-7.3	Roxboro Closure Options Reports
DJW-7.4	Sutton Closure Options Analysis
DJW-7.5	Weatherspoon Closure Option Analysis
DJW-8.1.1	Discovery Analysis – Closure Options
DJW-8.1.2	Discovery Analysis – Recommended Disallowances
DJW-8.3	SOC's and Closure Info by Site
DJW-8.4	Original Versus Updated Risk Classifications
DJW-8.5	Analysis of Risk Classifications and Water Spends
DJW-9.1	January 25, 2019 Article by Catherine Morehouse in *Utility Dive*

OFFICE OF REGULATORY STAFF
DAN J. WITTLIFF, BCEE
EXHIBIT LIST
DUKE ENERGY PROGRESS, LLC
DOCKET NO. 2018-318-E

DJW-9.2	May 18, 2016 NC DEQ Proposed Classifications for all Coal Ash Ponds in North Carolina
DJW-9.3	November 14, 2018 NC DEQ Low Risk Classifications for Allen, Belews Creek, Buck, Cliffside, and Marshall Coal Ash Ponds